# Socio-economic implications of the Forage Livestock Balance Policy

*Li Yang*

School of Economics and Management, Inner Mongolia University, Hohhot, 010021, People's Republic of China
Contact email: emyangli@imu.edu.cn

**Keywords:** Public policy, command and control instrument, market-based instruments.

## Introduction

There are generally two kinds of rangeland dynamics models, range model and state-and-transition model, as the concept of livestock carrying capacity was not as useful as expected in non-equilibrium rangeland systems (Behnke and Abel 1996; Turner 1993), although the equilibrium and non-equilibrium ecosystems are not distinguished as different (Briske, Fuhlendorf *et al.* 2003). Based on range model theory, the Forage Livestock Balance Policy (FLBP) has been implemented for ten years in China.

This policy has been trying to adjust the utilization of grasslands according to the assessed livestock carrying capacity (LCC). After ten years experience, this paper reports on the outcomes and effects of the policy.

## FLBP has reduced livestock numbers

It was generally believed that the original rangeland was overgrazed by more than 20%, and livestock reduction was the main objective for local government to protect the rangeland. The FLBP achieved this with the total number of sheep in Inner Mongolia Pastoral counties (IMPA) decreasing sharply from 21.8 million in 2004 to 14.5 million in 2010 (Table 1).

## FLBP caused considerable controversy

The FLBP was too complex to calculate the herders' LCC precisely enough to adjust utilization, and large seasonal fluctuations in grassland production dynamics often damage herders' bargaining ability and benefit (Yang and Hou 2004), so that FLBP could not avoid the overuse and overstocking in grasslands effectively (Yang 2011).
Recently, the issue of overgrazing has been queried, as some researchers indicated that there was no overgrazing in the natural grassland in IMPA according to 2008 monitoring data (Xu, Yang *et al.* 2012). Additionally some researchers believed that the highest carrying capacity level in IMPA was no more than half of the rational carrying capacity (1.14 sheep units/ha ) from 1988 to 2008 (Da and Zheng 2012).

## FLBP was absolutely necessary in grassland management

The FLBP was severely criticized by scholars, but was supported by managers. Because there were some vital faults in the grassland management system, the household contract system in grassland (HCSG) did not protect property rights enough because of a lack of exclusion and enforcement. As a result, the tragedy of the commons in pasture areas had become worse after HCSG was put into force (Yang 2007). At present, FLBP was the only judicial regulation of competition among herders. FLBP could control the overgrazing problem which was caused by the HCSG, and FLBP became so essential that it was impossible to abolish the FLBP before HCSG was correctly reformed.

**Table 1. Livestock numbers and overgrazing rate in the Inner Mongolia Autonomous Region (10 000 heads)**

| | Overgrazing rate in natural grassland (%)* | Total number of large animals, sheep and goats (middle of year) ** | Total number of sheep and goats (middle of year) ** | Total number of large animals, sheep and goats (end of year) ** | Total number of sheep and goats (end of year) ** | Total number of large animals in IMPA (end of year) *** | Total number of sheep in IMPA (end of year) *** | Total number of goats in IMPA (end of year) *** |
|---|---|---|---|---|---|---|---|---|
| 2004 | | 9274.4 | 7514.7 | 6722.9 | 5318.5 | 302.3 | 2189.9 | 1152.3 |
| 2005 | | 10615.3 | 8713.0 | 6903.5 | 5420.0 | | | |
| 2006 | 22 | 11050.5 | 9002.6 | 6508.8 | 5102.5 | 331.2 | 2427.6 | 1265.6 |
| 2007 | 20 | 10854.4 | 8774.6 | 6524.3 | 5064.2 | 338.5 | 2386.7 | 1278.5 |
| 2008 | 18 | 10677.7 | 8442.9 | 6519.4 | 5125.3 | 493.1 | 1382.5 | 1212.7 |
| 2009 | 25 | 10858.5 | 8512.2 | 6748.6 | 5197.2 | 358.4 | 1418.0 | 1044.9 |
| 2010 | 23 | 10798.5 | 8408.0 | 6845.7 | 5277.2 | 372.3 | 1448.9 | 959.0 |
| 2011 | 18 | 10762.6 | 8347.5 | 6806.2 | 5276.0 | | | |

*National grassland monitoring report; **2012 Inner Mongolia statistical yearbook; *** China animal husbandry Yearbook

## FLBP was not balance management

It may be argued that the FLBP should not attempt to adjust the dynamic balance between forage, livestock, water and population by balancing the quantity between forage grass and livestock demand, but rather focus on the quality of the grassland. Moreover, the FLBP should reconstruct a new management method which adjusts the grassland utilization through the use of economic instruments, such as tradable livestock carrying capacity.

## Conclusions

FLBP should not be based on the dynamic balance between forage and livestock; the balance among population, forage and livestock; or the balance among population, forage, water and livestock. Transferable grazing rights should be put into practice instead of the present command and control method. The FLBP should not focus on the quantity balance between forage grass and livestock, but focus on the incentive mechanism and reform from command and control instrument to market-based instruments such as tradable grazing permits.

## Acknowledgments

This study was supported by National Natural Science Foundation of China (71063014); Natural Science Foundation of Inner Mongolia Autonomy Region (2010BS1003)

## References

Behnke RH, Abel NOJ (1996) Revisited: the overstocking controversy in semi-arid Africa. *World Animal Review* **87**, 4-27.

Briske DD, Fuhlendorf SD, Smeins FE (2003) Vegetation dynamics on rangelands: a critique of the current paradigms. *Journal of Applied Ecology* **40**, 601-614.

Da LT, Zheng YS (2012) Over-grazing de Facto or Illusive Over-grazing? *Chinese Rural Economy* **5**, 4-18.

Turner M (1993) Overstocking the Range: A Critical Analysis of the Environmental Science of Sahelian Pastoralism. *Economic Geography* **69**, 402-421.

Xu B, Yang XC, Jin YX, Wang DL, Yang Z, Li JY, Liu HQ, Yu HD, Ma HL (2012) Monitoring and evaluation of grassland-livestock balance in pastoral and semi-pastoral counties of China. *Geographical Research* **31**, 1998-2006.

Yang L (2007) Governance of Grassland: How to Improve the Household Contracting System for Grassland? *Chinese Rural Economy* **12**, 62-68.

Yang L (2011) Household Contract Responsibility System Reform in Pasture Area based on Market Economy. *Issues in Agricultural Economy* **10**, 102-108.

Yang L, Hou XY (2004) Resilience Study in "Forage and Animal Balance" Management —Based on the Case of Xinlinguole, Inner Mongolia Autonomy. *Pratacultural Science* **8** (sup. 1), 77-80.